#19 10/15/02 DH

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s):	E.E. Eibling et al.
Case:	7-1-2
Serial No.:	09/385,725
Filing Date:	August 30, 1999
Group:	2684
Examiner:	Pablo N. Tran
Title:	Aggregate Power Measurement

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Signature: Teresa M. Hanlin Date: October 3, 2002

TRANSMITTAL OF APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Submitted herewith are the following documents relating to the above-identified patent application:

(1) Appeal Brief in triplicate (original and two copies); and
(2) Copy of Notice of Appeal, filed on June 26, 2002, with copy of stamped return postcard indicating receipt of Notice by PTO on July 3, 2002.

Please extend the period for response by one month to October 3, 2002. Please charge **Ryan, Mason & Lewis, LLP Account No. 50-0762** the amount of $430 ($320 to cover this submission under 37 CFR §1.17(c) and $110 to cover the one month extension fee). In the event of non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Deposit Account No. 50-0762** as required to correct the error. A duplicate copy of this letter and two copies of the Appeal Brief are enclosed.

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Respectfully submitted,

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Date: October 3, 2002

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Eibling 7-1-2

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APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants hereby appeal the final rejection dated March 26, 2002 of claims 1-22 of the above-identified application.

REAL PARTY IN INTEREST

The present application is assigned to Lucent Technologies Inc., as evidenced by an assignment recorded August 30, 1999 in the U.S. Patent and Trademark Office at Reel 010217, Frame 0206. The assignee Lucent Technologies Inc. is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals and interferences.

STATUS OF CLAIMS

Claims 1-22 are pending in the present application. Claims 1-22 stand finally rejected under 35 U.S.C. §102(b). Claims 1-22 are appealed.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the final rejection.

SUMMARY OF INVENTION

The present invention is directed to methods for determining a power level of a forward-link signal or a set of forward-link signals in a wireless system. By way of example, the methods are implementable in base stations 200 and 400 shown in respective FIGS. 3 and 4 of the application. With reference to FIG. 3, the channel unit controller 250 in an illustrative embodiment of the invention determines the power level P[n] of a traffic signal for a measurement interval. As described at page 9, lines 23-29, of the specification,

> [t]he measurement interval has a duration smaller than or equal to the time period in which at least one power-indicative traffic signal characteristic can change. For example, the information rate of the traffic signal is one of the power-indicative signal characteristics, and the information rate can change once per frame; therefore, the measurement interval can be one frame, or one or several power control groups, where a power control group is 1/16 of a frame. The measurement interval can be of a fixed length or of a variable length.

Such an arrangement allows the base station to more accurately determine the power level of a signal set, thereby providing improvements in terms of pilot fraction measurement and overload condition determination (Specification, page 7, lines 16-23).

ISSUE PRESENTED FOR REVIEW

Whether claims 1-22 are properly rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,715,526 (hereinafter "Weaver").

GROUPING OF CLAIMS

The claims in the above-noted group of claims do not stand or fall together. Claims 1, 3, 4, 8, 10, 11, 12, 13, 17, 18, 19 and 20 stand or fall together. Dependent claims 2 and 9 are believed to be separately patentable, dependent claims 5 and 14 are believed to be separately patentable, dependent claims 6 and 15 are believed to be separately patentable, dependent claims 7 and 16 are believed to be separately patentable, dependent claim 21 is believed to be separately patentable, and dependent claim 22 is believed to be separately patentable.

ARGUMENT

The Examiner in formulating the §102(b) rejection states that Weaver in column 1, lines 9-10, and column 10, lines 5-27, discloses the claimed methods for determining the power level of a forward link signal in a wireless system (Final Office Action, page 2, section 1). More particularly, the Examiner argues that the column 10, lines 5-27, of Weaver disclose the limitation of independent claims 1 and 8 regarding "the measurement interval having a duration smaller than or equal to the time period in which at least one power-indicative signal characteristic can change." For the reasons specified below, Applicants believe that the Examiner is incorrect on this point.

The present invention as set forth in each of independent claims 1 and 8 calls for determining the power level of a forward-link signal in a wireless system for a measurement interval using power-indicative signal characteristics, where the measurement interval has "a duration smaller than or equal to the time period in which at least one power-indicative signal characteristic can change." Applicants have indicated in their specification at, for example, page 7, lines 16-23, a number of advantages associated with the claimed power level determination methods:

> Determining the power level of at least one forward-link signal of a base station for a measurement interval that has a duration smaller than or equal to the time period in which at least one power-indicative signal characteristic can change allows the base station to more accurately determine the power level of a signal set. This in turn allows the base station to more accurately determine any measurement, such as the pilot fraction, or condition, such as the overload condition, that requires knowledge of the power level of the signal set. For

example, this allows the base station to better detect overload conditions, thus protecting the amplifier.

As indicated above, the Examiner argues in the outstanding final Office Action that Weaver discloses the power level determination methods as set forth in independent claims 1 and 8. More particularly, the Examiner states that Weaver discloses the claim limitations regarding "the measurement interval having a duration smaller than or equal to the time period in which at least one power-indicative signal characteristic can change" (Final Office Action, page 3, section 4, lines 6-8). In support of his argument, the Examiner states that the measurement interval in Weaver "is usually a full rate frame" (Final Office Action, page 3, section 4, line 10). Applicants respectfully disagree. As will be described in greater detail below, it is believed that the Examiner is mischaracterizing the teachings of the Weaver reference with regard to at least the measurement interval duration limitations of independent claims 1 and 8.

The Weaver reference discloses an apparatus and method for controlling a final transmit power level y of a base station, through the use of a transmit power tracking loop shown generally in FIG. 2 of Weaver. The final transmit power level y is measured by a transmit power detector 40 in the FIG. 2 transmit power tracking loop. The FIG. 2 transmit power loop further includes a discrete time H_3 filter 22 which receives as a first input a desired output power level y_d, and receives as a second input the final transmit power level y from the transmit power detector 40. The H_3 filter 22 filters the two inputs to generate a transmit power tracking gain y' which is input to a variable gain block 24. The variable gain block 24 receives as an input a raw radio frequency transmit signal w and produces a final output signal w_o. The transmit power detector 40 measures the power of the final output signal w_o to produce the final transmit power level y which is supplied to the H_3 filter 22. FIG. 3 of Weaver shows channel element processors 36*a*-36*i* and base station transceiver system controller (BTSC) 37 that are collectively used to generate the desired output power level y_d that is supplied as the first input to the H_3 filter 22.

The Examiner argues that the above-described power measurement arrangement, along with other related drawings and corresponding text in the Weaver reference, anticipates the measurement interval duration limitations of independent claims 1 and 8. However, this assertion is inconsistent with explicit teachings from the Weaver reference. For example, the Weaver reference in FIG. 4

indicates that within a given one of the channel element processors 36*a*-36*i*, gain and rate information are sampled by a first sampler 42, the resulting samples are applied to a calculator 43, the output of the calculator 43 is applied to an H_1 filter 44, the output of the H_1 filter 44 is sampled in a second sampler 45, and the resulting samples are time stamped before being delivered to the BTSC 37 for further processing. The Weaver reference then explicitly states as follows regarding the above-noted FIG. 4 elements, in column 11, lines 37-51, with emphasis supplied:

> The basic purpose of sampler 42, H_1 filter 44 and second sampler 45 is to reduce the amount of messaging from each channel element processor 36*a*-36*i*. Each channel element processor 36*a*-36*i* produces a certain number of messages that provide a variety of system information. If a expected power message was sent from every channel element processor 36*a*-36*i* for each frame in addition to the other system information messages, the messaging would overburden the system. To reduce the number of messages, each channel element processor 36*a*-36*i* performs a sampling and averaging function of the expected power by summing over a group of frames as set by the time constant ψ_1 of H_1 filter 44 and the sample rates of sampler 42 and second sampler 45. The filtered expected power information can be passed at a relatively slower rate (1/(N*M)) than once per frame.

It is therefore apparent that if the power measurement relied upon by the Examiner is the determination of the desired output power level y_d, this determination does not occur within the claimed measurement interval duration, i.e., within a duration smaller than or equal to the time period in which at least one power-indicative signal characteristic can change, since the power-indicative signal characteristics can change from frame to frame. Moreover, if the power measurement relied upon by the Examiner is the determination of the final transmit power level y, this determination also does not occur within the claimed measurement interval duration. This is apparent from, e.g., column 7, line 63 to column 8, line 3 and column 9, lines 49-54 of Weaver, which collectively disclose that the final transmit power level y need only be determined at a single point in time within a given multi-frame measurement interval associated with determination of the desired output power level y_d.

Applicants respectfully submit that the Examiner is thus incorrect in his above-noted assertion that in Weaver the measurement interval "is usually a full rate frame." The explicit teachings of Weaver, which clearly contemplate a measurement interval duration comprising multiple frames, are directly contrary to the Examiner's assertion. The arrangements of Weaver relied on by the Examiner are thus of a conventional type similar to that described by Applicants at page 1, line 10 to page 6, line 7, of the specification, and will suffer from the corresponding problems described by Applicants therein. As indicated above, the present invention as claimed advantageously overcomes these problems of Weaver and other conventional arrangements.

With regard to the portion of the Weaver reference in column 10, lines 5-27, as cited on page 2 of the final Office Action, it is believed that this portion also fails to meet the measurement interval duration limitations of independent claims 1 and 8. For example, the cited portion states as follows with regard to calculation of expected power:

> Thus in calculating the expected power the ratio of the number of power control symbols within a frame and the ratio of the number of data symbols to the total number of symbols within a frame is used to scale the corresponding energy calculations.

Applicants note that this does not disclose or suggest a measurement interval having a duration smaller than or equal to the time period in which at least one power-indicative signal characteristic can change, as set forth in claims 1 and 8. Moreover, there are specific teachings away from the limitation in question as it relates to the cited column 10, lines 5-27, portion of Weaver. For example, Weaver indicates that "the Power Control Subchannel Data Rate, r_s, is always full rate (i.e., is always equal to one) for the traffic channel" (Weaver, column 10, lines 12-15), and further states as follows, in column 10, lines 28-34, with emphasis supplied:

> The pilot channel data rate and gain are typically a fixed constant system wide. Thus Channel Gain, G_i, and the Channel Data Rate, r_i, are fixed constants for every frame. The sync and paging channels data rates are typically full rate at all times and the gain is also a system wide constant. For the pilot, paging, and sync channels the number of power control information symbols per frame, s_{pc}, is a zero.

Applicants therefore believe that the portions of Weaver relied upon by the Examiner fail to anticipate or even suggest the limitations in question.

The Examiner in the Advisory Action mailed July 30, 2002, further cites to FIG. 10 and column 22, lines 53-65 of Weaver as meeting the measurement interval duration limitations of claims 1 and 8. Applicants respectfully disagree. The cited portion of the Weaver reference states as follows:

> As described above, the gain and data rate for each channel are input to each channel element processor 36*a*-36*i*, which output the filtered expected powers . . . to BTSC 37. BTSC 37 sums the filtered expected powers . . . and generates and outputs desired output power, y_d, to RFIC 38. RFIC 38 processes y_d, together with the measured transmit power level as measured by transmit power detector 39 and $A_{TX,BREATHING}$, to obtain y'.
>
> In turn, y' is input to additional processor 310, which outputs the signal that is amplified by HPA 76 to generate the final output signal, w_o.

Again, there is no teaching or suggestion in the cited portion of Weaver regarding the measurement interval duration limitations of claims 1 and 8. The filtered expected powers, as indicated in the above-cited column 11, lines 37-51 portion of Weaver, are determined for a measurement duration comprising multiple frames. The cited portions of Weaver relied on by the Examiner in formulating the §102(b) rejection are therefore consistent with the characterization of conventional practice provided by Applicants in the background portion of their specification at page 1, line 10 to page 6, line 7.

Inasmuch as the Weaver reference fails to disclose or suggest at least the measurement interval duration limitations of independent claims 1 and 8, the rejection of these claims under §102(b) is believed to be improper and the rejection should be withdrawn.

Dependent claims 2-7 and 9-22 are believed allowable for at least the reasons identified above with regard to their corresponding independent claims. Moreover, one or more of these claims are believed to include separately patentable subject matter clearly not anticipated by the Weaver reference, as described below.

With regard to dependent claims 2 and 9, these claims specify that the measurement interval has a duration smaller than or equal to the time period in which any of power-indicative signal characteristics can change. Applicants have been unable to find this limitation in the Weaver reference, and the Examiner has failed to identify with particularity the specific portion of Weaver that is allegedly anticipatory of this limitation. As described in detail above, Weaver fails to teach or suggest a measurement interval duration smaller than or equal to the time period in which at least one power-indicative signal characteristics can change, and thus similarly fails to teach or suggest a measurement interval duration smaller than or equal to the time period in which any of a plurality of such characteristics can change.

With regard to dependent claims 5 and 14, these claims specify that the power-indicative signal characteristics comprise whether the information contained in the signal is control information. The Examiner argues that this limitation is shown in FIGS. 4 and 7 and column 15, lines 27-62 of Weaver (Final Office Action, page 4, first paragraph). Applicants respectfully disagree. The cited portion of Weaver does not teach or suggest that a determination that a signal contains control information may be used as a power-indicative signal characteristic as claimed.

With regard to dependent claims 6 and 15, these claims specify that the power-indicative signal characteristics comprise whether the call is in set up. Again, the Examiner argues that this limitation is shown in FIGS. 4 and 7 and column 15, lines 27-62 of Weaver. Applicants respectfully disagree. The cited portion of Weaver does not teach or suggest that a determination that a call is in set up may be used as a power-indicative signal characteristic as claimed.

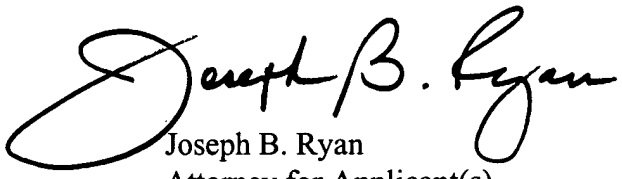
With regard to dependent claims 7 and 16, these claims specify that the power-indicative signal characteristics comprise whether the call is in soft-handoff. Once again, the Examiner argues that this limitation is shown in FIGS. 4 and 7 and column 15, lines 27-62 of Weaver. Applicants respectfully disagree. The cited portion of Weaver does not teach or suggest that a determination that a call is in soft-handoff may be used as a power-indicative signal characteristic as claimed.

With regard to dependent claim 21, this claim specifies that the measurement interval comprises a frame. However, the portions of Weaver cited by the Examiner as teaching this limitation in fact teach multiple-frame measurement intervals, as was described in greater detail above.

With regard to dependent claim 22, this claim specifies that the measurement interval comprises a power control group. Applicants have described such an arrangement in their specification at, for example, page 9, lines 23-29. The Examiner argues that the limitation is met by Weaver, but Weaver provides no specific teaching or suggestion that the claimed measurement interval may be a power control group, e.g., 1/16 of a frame.

In view of the above, Applicants believe that claims 1-22 are in condition for allowance, and respectfully request the withdrawal of the §102(b) rejection.

Respectfully submitted,



Date: October 3, 2002

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APPENDIX

1. A method for determining a power level of a forward-link signal in a wireless system, the method comprising the steps of:

determining a plurality of power-indicative signal characteristic of the signal; and

determining the power level of the signal for a measurement interval using the power-indicative signal characteristics, the measurement interval having a duration smaller than or equal to the period in which at least one power-indicative signal characteristic can change.

2. The method of claim 1, wherein the measurement interval has a duration smaller than or equal to the time period in which any of power-indicative signal characteristics can change.

3. The method of claim 1, wherein the power-indicative signal characteristics comprise an information rate of the signal.

4. The method of claim 1, wherein the power-indicative signal characteristics comprise a gain of the signal as determined by the signal's individual power control.

5. The method of claim 1, wherein the power-indicative signal characteristics comprise whether the information contained in the signal is control information.

6. The method of claim 1, wherein the power-indicative signal characteristics comprise whether the call is in set up.

7. The method of claim 1, wherein the power-indicative signal characteristics comprise whether the call is in soft-handoff.

8. A method for determining a power level of a set of forward-link signals transmitted by a base station in a wireless system, the method comprising the step of:

determining a plurality of power-indicative signal characteristic of each of the signal in the signal set;

determining the power level of the each of the signals for a measurement interval using the power-indicative signal characteristics, the measurement interval having a duration smaller than or equal to the time period in which at least one power-indicative signal characteristic can change; and

determining the power level of the signal set the measurement interval using the power levels of each of the signals.

9. The method of claim 8, wherein the measurement interval has a duration smaller than or equal to the time period in which any of power-indicative signal characteristics can change.

10. The method of claim 8, wherein:

the step of determining the power level of the each of the signals in the signal set comprises, in a channel unit controller:

obtaining an information rate of a signal and a gain of the signal as determined by the signal's individual power control;

multiplying the information rate of the signal and the gain squared of the signal to obtain the power level of the signal; and

forwarding the power level each signal to a master controller; and

the step of the determining the power level of the signal set comprises summing the power level of each signal in a master controller.

11. The method of claim 8, wherein the step of determining the power level of the each of the signals in the signal comprises, in a master controller:

obtaining an information rate of a signal and a gain of the signal as determined by the signal's individual power control; and

multiplying the information rate of the signal and the gain squared of the signal to obtain the power level of the signal.

12. The method of claim 8, wherein the power-indicative signal characteristics comprise an information rate of the signal.

13. The method of claim 8, wherein the power-indicative signal characteristics comprise a gain of the signal as determined by the signal's individual power control.

14. The method of claim 8, wherein the power-indicative signal characteristics comprise whether the information contained in the signal is control information.

15. The method of claim 8, wherein the power-indicative signal characteristics comprise whether the call is in set up.

16. The method of claim 8, wherein the power-indicative signal characteristics comprise whether the call is in soft-handoff.

17. The method of claim 8, wherein the signal set comprises all the signals in a sector of a cell in which the base station is located.

18. The method of claim 8, wherein the signal set comprises all the signals amplified by an amplifier of the base station.

19. The method of claim 8, wherein the signal set comprises a plurality of traffic signals.

20. The method of claim 8, wherein the signal set comprises a plurality of traffic signals and at least one control signal.

21. The method of claim 8, wherein the measurement interval comprises a frame.

22. The method of claim 8, wherein the measurement interval comprises a power control group.